FACTORING WORKSHEET --- KE

College Algebra
Unit 5 Review

Name Key
Date

I. Factor completely over the integers:

1) m^4+64

$m^4+16m^2+64-16m^2$

$(m^2+8)^2-16m^2$

$(m^2+8-4m)(m^2+8+4m)$

$(m^2-4m+8)(m^2+4m+8)$

2) $-a^6+64$

$-(a^6-64)$

$-(a^2-4)(a^4+4a^2+16)$

$-(a-2)(a+2)(a^4+4a^2+16)$

$-(a-2)(a+2)[(a^4+8a^2+16)-4a^2]$

$-(a-2)(a+2)[(a^2+4)^2-4a^2]$

$-(a-2)(a+2)(a^2+4-2a)(a^2+4+2a)$

3) $r^2-2r-25s^2+10s$

$(r^2-25s^2)+(-2r+10s)$

$(r-5s)(r+5s)+-2(r-5s)$

$(r-5s)(r+5s-2)$

4) $18a^3-84a^2+98a$

$2a(9a^2-42a+49)$

$2a(3a-7)^2$

441

9 49

21 21

5) $3a^4+6a^3-9a-18$

$3[(a^4+2a^3)+(3a-6)]$

$3[a^3(a+2)-3(a+2)]$

$3(a+2)(a^3-3)$

6) $x^3-2x^2y+4xy^2+8y^3$

$x^2(x-2y)+4y^2(x-2y)$

$(x-2y)(x^2-4y^2)$

$(x-2y)(x-2y)(x+2y)$

$(x-2y)^2(x+2y)$

7) $4a^2-25x^2+9y^2+b^2+30xy-4ab$

$(-25x^2+30xy-9y^2)+(4a^2-4ab+b^2)$

$-(25x^2-30xy+9y^2)+(2a-b)^2$

$-(5x-3y)^2+(2a-b)^2$

$(2a-b)^2-(5x-3y)^2$

$(2a-b-5x+3y)(2a-b+5x-3y)$

8) $8(x+y)^3+(x-y)^3$

let $a=x+y$

$b=x-y$

$8a^3+b^3$

$(2a+b)(4a+2ab+b^2)$

$[2(x+y)+(x-y)][4(x+y)^2-2(x+y)(x-y)+(x-y)^2]$

$(2x+2y+x-y)(4(x^2+2xy+y^2)-2(x^2-y^2)+x^2-2xy+y^2)$

$(3x+y)(4x^2+8xy+4y^2-2x^2+2y^2+x^2-2xy+y^2)$

$(3x+y)(3x^2+6xy+7y^2)$

2. $x(x$ $3^{-5}(3x^5 -$

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9) $7mx+7my-y+7mz-x-z$

$(7mx+7my+7mz)+(y-x-z)$

$7m(x+y+z)+-1(y+x+z)$

$(x+y+z)(7m-1)$

10) $4(3x+1)^2-13(3x+1)(x-2)+10(x-2)^2$

let $a = 3x+1$

let $b = x-2$

$4a^2-13ab+10b^2$

$(4a^2-5ab)+(-8ab+10b^2)$

$a(4a-5b)+-2b(4a-5b)$

$(4a-5b)(a-2b)$

$[4(3x+1)-5(x-2)][(3x+1)-2(x-2)]$

$(12x+4-5x+10)(3x+1-2x+4)$

$(7x+14)(x+5)$

$7(x+2)(x+5)$

40

$-5 \quad -8$

11) $6b^3(4x+3)^4(x-2)^3+9b(4x+3)^2(x-2)^4$

$3b(4x+3)^2(x-2)^3[2b^2(4x+3)^2+3(x-2)]$

$3b(4x+3)^2(x-2)^3[2b^2(16x^2+24x+9)+3x-6]$

$3b(4x+3)^2(x-2)^3(32x^2b^2+48xb^2+18b^2+3x-6)$

II. Factor completely over the real and complex.

12) $x^4-64 = (x^2-8)(x^2+8)$

$(x-\sqrt{8})(x+\sqrt{8})(x-\sqrt{-8})(x+\sqrt{-8})$

$(x-2\sqrt{2})(x+2\sqrt{2})(x-2i\sqrt{2})(x+2i\sqrt{2})$

13) $9x^4(x^2-9)-44x^2(x^2-9)-5(x^2-9)$

$(x^2-9)(9x^4-44x^2-5)$

$(x-3)(x+3)(9x^2+1)(x^2-5)$

$(x-3)(x+3)(3x-i)(3x+i)(x-\sqrt{5})(x+\sqrt{5})$